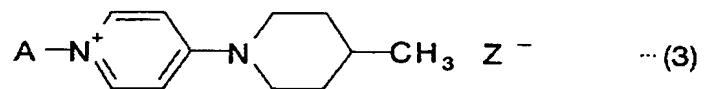


## CLAIMS

1. A process for producing a radioactive-fluorine-labeled compound comprising the steps of introducing [<sup>18</sup>O] water containing [<sup>18</sup>F] fluoride ions into a column packed with an anion-exchange resin for labeled-compound synthesis to capture [<sup>18</sup>F] fluoride ions; dehydrating the packed resin of the column; and obtaining a radioactive-fluorine-labeled compound by introducing a reaction substrate into the column to cause a displacement reaction between the [<sup>18</sup>F] fluoride ion captured in the column and the leaving group of the reaction substrate, characterized by further comprising a step of passing carbon dioxide gas through the column between the step of dehydrating the resin of the column and the step of introducing the reaction substrate.
2. The process for producing a radioactive-fluorine-labeled compound according to claim 1, wherein in the step of passing carbon dioxide gas, the column is maintained at between 60 to 130°C.
3. The process for producing a radioactive-fluorine-labeled compound according to claim 1 or 2, wherein in the step of passing carbon dioxide gas, the carbon dioxide gas is passed through at a flow rate of between 1.0 and 1,000 mL/min for 1 to 15 minutes.
4. The process for producing a radioactive-fluorine-labeled compound according to any of claims 1 to 3, wherein the anion-exchange resin for labeled-compound synthesis is at least one represented by the

following formulae (1) to (3):



wherein A represents a carrier, Y represents a monovalent hydrocarbon group having 1 to 8 carbon atoms, and Z<sup>-</sup> represents an exchange group.

5. The process for producing a radioactive-fluorine-labeled compound according to claim 4, wherein the Z<sup>-</sup> in the formula comprises at least one selected from HCO<sub>3</sub><sup>-</sup> or CO<sub>3</sub><sup>2-</sup>.

6. A production apparatus for a radioactive-fluorine-labeled compound comprising as constituent features:

means for introducing [<sup>18</sup>O] water containing [<sup>18</sup>F] fluoride ions from a target box into a resin column for labeled-compound synthesis; and

a resin column for labeled-compound synthesis for capturing [<sup>18</sup>F] fluoride ions from the [<sup>18</sup>O] water containing [<sup>18</sup>F] fluoride ions introduced from the target box, and then carrying out a labeling reaction

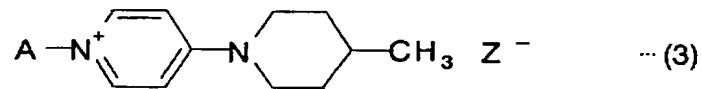
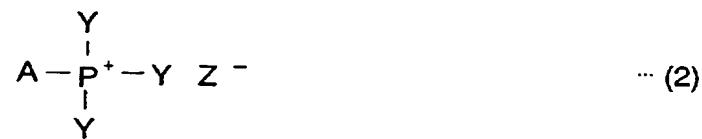
thereof with a reaction substrate,

characterized by further comprising a carbon dioxide gas supply source and a discharge outlet, said carbon dioxide gas supply source being for introducing carbon dioxide gas into the resin column for labeled-compound synthesis.

7. The production apparatus for a radioactive-fluorine-labeled compound according to claim 6, characterized in that the carbon dioxide gas supply source is directly connected to the resin column for labeled-compound synthesis.

8. The production apparatus for a radioactive-fluorine-labeled compound according to claim 6 or 7, characterized by further comprising means for heating the resin column for labeled-compound synthesis.

9. The production apparatus for a radioactive-fluorine-labeled compound according to any of claims 6 to 8, characterized in that at least one kind of resin represented by the following formulae (1) to (3) is packed into the resin column for labeled-compound synthesis,



wherein A represents a carrier, Y represents a monovalent hydrocarbon group having 1 to 8 carbon atoms, and Z<sup>-</sup> represents an exchange group.

10. The production apparatus for a radioactive-fluorine-labeled compound according to claim 9, characterized in that the Z<sup>-</sup> in the formula comprises at least one selected from HCO<sub>3</sub><sup>-</sup> or CO<sub>3</sub><sup>2-</sup>.